

Abstract

A method of forming a doped polycrystalline silicon gate in a Metal Oxide Semiconductor (MOS) device. The method includes forming first an insulation layer on a top surface of a crystalline silicon substrate. Next, an amorphous silicon layer is formed on top of and in contact with the insulation layer and then a dopant is introduced in a top surface layer of the amorphous silicon layer. The top surface of the amorphous silicon layer is irradiated with a laser beam and the heat of the radiation causes the top surface layer to melt and initiates explosive recrystallization (XRC) of the amorphous silicon layer. The XRC process transforms the amorphous silicon layer into a polycrystalline silicon gate and distributes the dopant homogeneously throughout the polycrystalline gate.

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